(No Model.) 2 Sheets—Sheet 1.

J. W. TALLMADGE.

PROCESS OF MANUFACTURING HYDROCARBON GAS.

No. 499,606. Patented June 13, 1893.

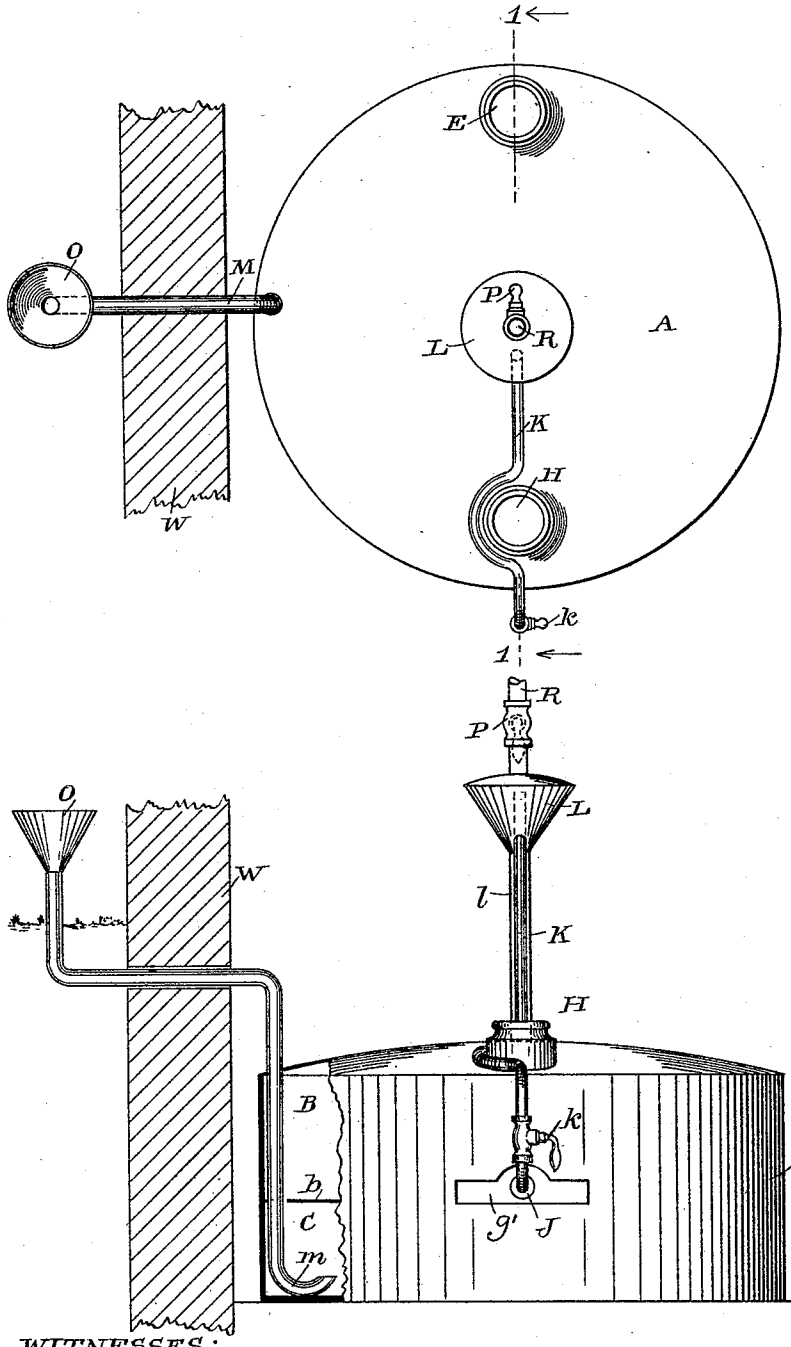

Fig. 1.

Fig. 2.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 4. Sec. 2-2.

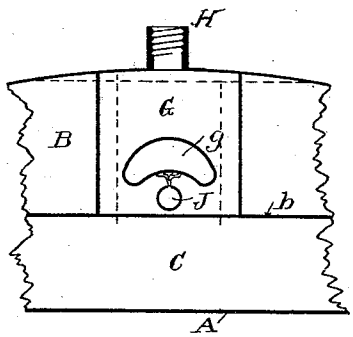


Fig. 3. Sec. 1-1.

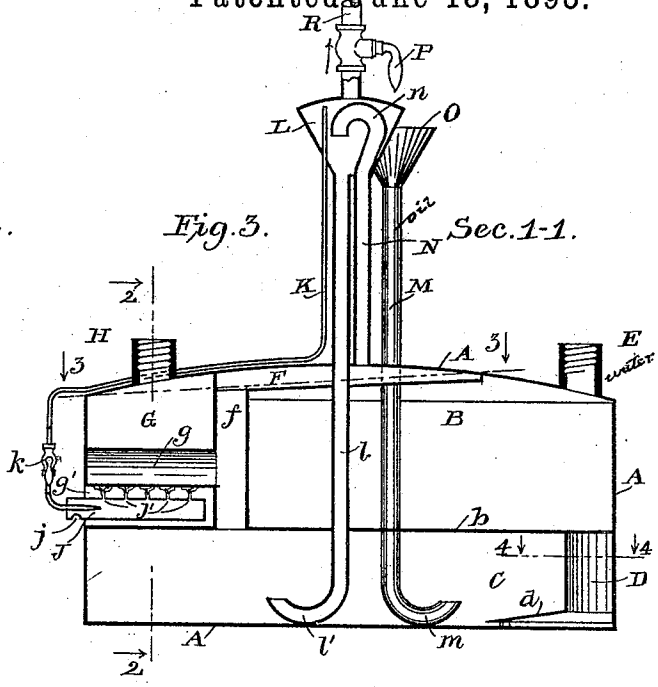


Fig. 5. Sec. 3-3.

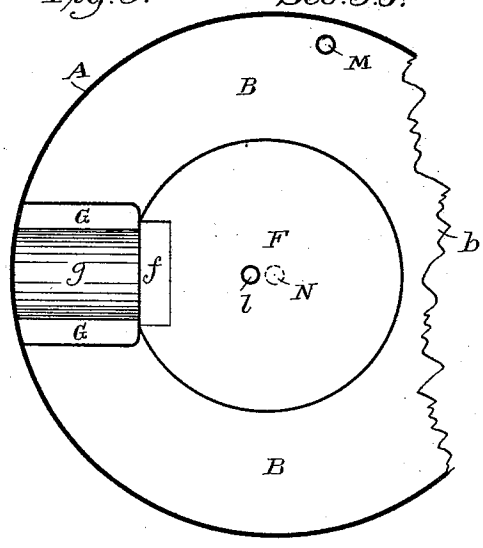
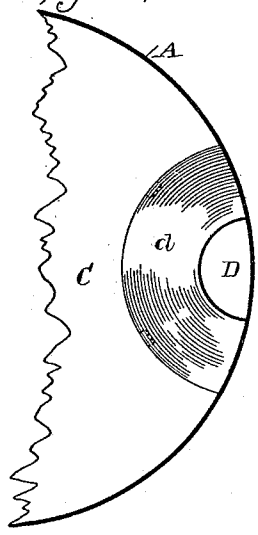


Fig. 6. Sec. 4-4.



WITNESSES:
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UNITED STATES PATENT OFFICE.

JAMES WINANTS TALLMADGE, OF ALBANY, NEW YORK.

PROCESS OF MANUFACTURING HYDROCARBON GAS.

SPECIFICATION forming part of Letters Patent No. 499,606, dated June 13, 1893.

Application filed November 12, 1892. Serial No. 451,800. (No model.)

To all whom it may concern:

Be it known that I, JAMES WINANTS TALLMADGE, a citizen of the United States, residing at the city and county of Albany, State of New York, have invented a certain new and useful Process of Manufacturing Hydrocarbon Gas, of which the following is a specification.

My invention relates to improvements in processes of generating hydro-carbon gas, in which hydro-carbon liquid is incased or held between two layers of water, (or other suitable fluids,) said apparatus being especially adapted for the illumination of buildings from isolated plants. I accomplish this object by means of the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a plan. Fig. 2 is an elevation. Fig. 3 is a cross section along the lines 1—1 on Fig. 1. Fig. 4 is a section along the lines 2—2 on Fig. 3. Fig. 5 is a section along the lines 3—3 on Fig. 3, and Fig. 6 is a section along the lines 4—4 on Fig. 3.

Similar letters refer to similar parts throughout the several views.

A represents a metallic receptacle usually cylindrical in form and closed at the top and bottom, which is divided into an upper compartment B, and lower compartment C, by means of a transverse partition *b;* in the top of receptacle A on either side, are openings E, and H, provided with pipe-nipples, as shown in Figs. 1 and 3, to which if desired piping may be connected and extended through wall W, to the outside atmosphere.

Beneath opening E and in compartment C, a segment of pipe D provided at its lower end with convexed flange *d*, connects with an opening in partition *b*, and is affixed to partition *b*, and side of compartment C and extends down to as near the bottom of compartment C as will permit the opening beneath the outer radius of flange *d* to equal the capacity of pipe D, as shown in Figs. 3 and 6.

Beneath opening H and in compartment B, a retort box G consisting of two vertical sides and a back, rests upon and is affixed to partition *b*, (which forms its bottom,) also affixed to top and side of receptacle A, (which forms its top and front,) and provided with an opening *g'* through side of receptacle A, just above partition *b*, as shown in Fig. 3. A crescent shaped retort *g* is suspended horizontally within retort box G. One end is closed by being affixed to side of receptacle A, just above opening *g'*. The other end opens through and is affixed to back of retort box G, as shown in Figs. 3 and 4.

Beneath the center top of receptacle A, is affixed the gasometer F, consisting of a circular formed narrow rimmed plate slightly sloping toward retort box G, (the top of receptacle A forming its top,) as shown in Figs. 3 and 5.

In compartment B, and against the back of retort box G, is affixed the flue *f* consisting of two vertical sides and a back, which surrounds opening in back of retort box G, (the back of retort box G forming its front,) its lower end being affixed to partition *b* and opening into compartment C, its upper end being affixed to and opening into gasometer F, as shown in Figs. 3 and 5.

A gas eduction pipe N is affixed to the top of receptacle A, and opens into the gasometer F and extends up a suitable distance, being provided at its top with a hook-shaped downward turned end *n*, as shown in Fig. 3.

A funnel-shaped condenser L is affixed around and incloses hook-shaped end *n* of eduction pipe N, and is provided with a drip pipe *l* which is affixed to and opens into the bottom of condenser L, extending downward through and affixed to the top of receptacle A, bottom of gasometer F and partition *b*, and to the bottom of compartment C, where it is J-shaped forming trap *l'*, as shown in Fig. 3.

A service pipe R is affixed to and opens into the top of condenser L, being provided with the stop-cock P, above the top of the condenser L, as shown in Figs. 2 and 3.

A gas pipe K, (for supplying permanent burner J,) extends from inside near the top to near the bottom of condenser L, to which it is affixed and extends down through the side of condenser L, thence along the line of pipe *l*, over top of receptacle A, around pipe-nipple of opening H, down side of receptacle A, where it is provided with cock *k*, thence turned and points into opening *g'* and provided at its lower end with a minute injecting tip, as shown in Figs. 1, 2 and 3.

A burner J is placed beneath the retort *g* slightly projecting through the opening *g'*, its

outer end encircling the end of pipe K, and it consists of a pipe closed at its back end and provided with feet, (to hold it in position,) its front end having an opening suitable to insert the end of pipe K, also having an opening *j* near its outer end in its under side, (to receive air sufficient to create a smokeless blue flame,) and a series of openings *j'* in its top (for gas jets), as shown in Fig. 3.

A pipe M (for supplying hydro-carbon liquid), provided at its top with funnel O, extends from a suitable distance above, downward through and affixed to the top near the side of the receptacle A, and partition *b* and to the bottom of compartment C, where it is J-shaped forming trap *m;* if desired, its upper end may be extended through wall W to the outside atmosphere, as shown in Fig. 2.

The receptacle A constituting a part of this gas apparatus, may be disposed in the cellar or basement of a building to be illuminated, or at any other convenient point adjacent thereto. The stop-cock P above the condenser L, being opened, (as the air cannot be displaced without vent, but water may be,) water is introduced at the opening E, and passes down through pipe D under flange *d*, until compartment C is filled. The stop-cock P then being closed, (to prevent water rising into flue *f*,) more water is introduced at opening E, and compartment B partially filled to about the level with the bottom of the retort *g*, and service pipe R is then connected to stop cock P. Hydro-carbon liquid is then introduced into the funnel O of filler-pipe M and fed into, rises and floats upon the surface of the water in compartment C. The agitation of the hydro-carbon liquid caused by its being introduced, liberates a certain amount of gas, which will fill vertical flue *f*, retort *g*, gasometer F, eduction pipe N, condenser L and together with the hydro-carbon liquid, displace and force the water from the lower compartment C under flange *d*, up through pipe D into compartment B, in proportion to the amount of hydro-carbon liquid introduced and the gas formed by its agitation. The pipe D prevents the hydro-carbon liquid and gas escaping from compartment C. The water thus forced up into compartment B exerts a hydraulic pressure that is held in check by the gas until it, (the gas,) is permitted to escape through pipe K by opening the stop-cock *k*, and it is ignited at permanent burner J, and heats retort *g*, (air being admitted through opening *g'* and emitted through opening H for combustion,) after which the hydraulic pressure is automatically controlled by the gas pressure; as the preliminary gas is consumed sufficient water returns to compartment C by its own gravity to force hydro-carbon liquid up into vertical flue *f*, until it flows into heated retort *g* to a depth sufficient to transform enough of it into gas to supply the permanent burner J. The illuminating burners may then be lighted. They are supplied from the top of condenser L, by means of service pipe R, which is provided with stop-cock P, and connects with the gas piping in the building, receiving only pure dry hydro-carbon gas, as all condensation caused by cooling, is returned to compartment C by means of drip-pipe *l*. Increased consumption relaxes the gas pressure in proportion to amount of gas consumed and permits the hydraulic pressure to increase the height and quantity of hydro-carbon liquid in heated retort *g*, sufficient only to transform enough hydro-carbon liquid into gas to meet the consumption; reduced consumption increases the gas pressure which overcomes the hydraulic pressure sufficient to reduce the height and quantity of hydro-carbon liquid in heated retort *g*, in proportion to the reduced consumption, thereby making the apparatus automatic.

The capacity of the apparatus depends upon the size of the retort *g*.

The apparatus is practical, inexpensive and positive in its operation.

I claim—

The process of manufacturing gas from hydro-carbon liquids which consists in supplying said hydro-carbon liquid to a heated retort by hydraulic pressure, the heat of the retort and the supply of the hydro-carbon liquid thereto being automatically controlled by the pressure of the gas generated, substantially as described.

JAMES WINANTS TALLMADGE.

Witnesses:

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GRACE T. MANY.